



# **TV White Spaces Unlicensed Devices**

***Threat to the DTV transition and our  
digital future***

# Television Spectrum

## Future TV Band Ch. 2 - 51

So-called vacant TV  
channels

Note: these frequencies are heavily  
used for licensed wireless  
microphones by news and sports  
departments.

Occupied TV  
Channels

# Small Amount of Interference

## Makes the DTV Picture Unwatchable



**Crystal Clear**

**Interference**

# Fixed vs. Personal Portable Devices

**TV Channel  
30**

**Fixed unlicensed  
system operating  
on co-channel TV-  
30**

**Portable unlicensed  
device in laptop**

TV Sets

**Unlicensed base  
station located outside  
station contour via  
geolocation. This  
system avoids  
interference!**

**Interference  
distances from a  
very low power  
(100 mW)  
unlicensed device  
to a digital TV set**

# FCC Report: Sensing Technology Does Not Work

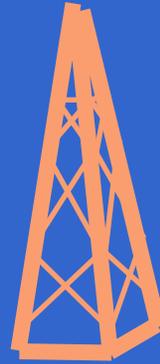
- Sensing TV signal does not work: (FCC Report July 31, 2007)
  - Microsoft Prototype:
    - Failed to detect a broadcast signal 40-75% of the time. The device turned on to channels that were being watched.
    - Transmitter caused interference
  - Philips
    - Only tested in the lab. Philips did not want any field testing.
    - Performed better but dropped off with weak signals that are typical in broadcast service area
- Failed to consistently detect wireless microphones
- Result is **co-channel interference which can range for miles**
- Your neighbor's device interferes with your TV set

# FCC Report: Sensing Technology Does Not Work

- Even if devices worked “as advertised” they would still cause co-channel interference
  - Sensing level of -114 dBm is not sufficient to protect DTV sets from interference
  - MSTV study of Washington/Baltimore found receivable signals levels well below -114 dBm
  - Devices would turn on to occupied channels

# Co channel interference from sensing failure

TV Station  
Service Area



TV Ch.  
30

TV Sets receiving interference may  
be located miles from the zone with no DTV signal



# TV White Space: Interference From Adjacent Channel

interference in a zone  
equal to 80 -87% of a TV stations service area

**-84dBm**

Adjacent Channel Interference

@ 10 meters from TV set

**Interference**

**zone 80-87%**

**of a**

**stations'**

**geographic**

**service area**

**-67.3 dBm**

**20 miles**

**50 miles**

**Adjacent Channel**

**Interference @ 80**

**meters from TV set!**

# Impossible to track down and police interference

# Microsoft TV White Spaces Development Platform Version 2

